OSWER Innovations Pilot

Potential Recycling of Medium Density Fiberboard

The Office of Solid Waste and Emergency Response (OSWER) initiated a series of innovative pilots to test new ideas and strategies for environmental and public health protection to make OSWER programs more efficient, effective, and user-friendly. A small amount of money is set aside to fund creative proposals. The creative projects test approaches to waste minimization, energy recovery, recycling, land revitalization, and homeland security that may be replicated across various sectors, industries, communities, and regions. We hope these pilots will pave the way for programmatic and policy recommendations by demonstrating the environmental and economic benefits of creative, innovative approaches to the difficult environmental challenges we face today.

BACKGROUND

The State of Tennessee requires engineered wood to be disposed of in landfills rather than recycled. Regulators are concerned with the potential adverse human and ecological health effects of formaldehyde-containing resins used in the manufacture of engineered wood, which includes plywood, particle board, and medium density fiberboard (MDF) The reuse of plywood and framing wood residue currently is being researched in Georgia, which could lead to onsite grinding of all construction wood residue into sawdust mulch to control erosion and improve soil conditions. However, the amount of formaldehyde gas that is released from resins in ground-up MDF is not known and is not currently being studied.

PILOT APPROACH

U.S. EPA Region 4, in partnership with the University of Tennessee's Center for Industrial Services and Biosystems Engineering and Environmental Science, will determine the fate of formaldehyde during MDF sawdust decomposition and determine whether MDF sawdusts can be safely land applied on agricultural soils. Laboratory microcosm experiments will be conducted and the soil and gases in the microcosm bottles will be monitored to determine the decomposition rate of MDF. Another set of laboratory experiments will be conducted to determine how formaldehyde is decomposed and the byproducts formed during decomposition. Field experiments will be conducted by amending small plots of agricultural soil with MDF sawdust. Corn will be grown on the plots using standard east Tennessee growing methods. Soil and gas will be monitored and the effect of the MDF sawdust on growth rate will be measured.

INNOVATION

Although formaldehyde was not detected in MDF mulch in previous studies, the crucial question of what happened to the formaldehyde was not answered. Therefore, the question about whether formaldehyde gases are being released and potentially affecting human health was not answered. The pilot will directly address the question of the risk to human health in the application of MDF sawdust on agricultural lands. The pilot will provide conclusive evidence about the fate of formaldehyde and potentially result in the reclassification of MDF so that it will be eligible for beneficial end uses rather than be disposed of in landfills.

BENEFITS

If MDF waste is shown to be environmentally benign, then large volumes of wood waste from furniture manufacturers and home builders could be recycled, saving landfill space and dramatically reducing disposal

costs. The major recycling market that could use this amount of wood waste is the direct application to agricultural lands, which are deficient in organic matter from generations of farming and topsoil erosion.

CONTACTS

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For additional information, visit the EPA OSWER Innovations web site at: www.epa.gov/oswer/IWG.htm.

Solid Waste
and Emergency
Response (5101T)

EPA 500-F-03 - 021
July 2003
www.epa.gov/oswer/